FIRECAST

A Near Real-Time Monitoring System Improving Forest Management in the Tropics

Assisting fire disaster prevention, forest conservation, REDD+, and sustainable livelihoods with fire risk forecasting and near real-time detection of fires, drought, and deforestation.

CHALLENGE

The loss of the world's natural habitat through timber extraction, wildland fires, and agricultural expansion is causing wide-ranging environmental and economic impacts including the degradation of ecological services like clean water, soil fertility, pollination, and local access to timber and non-timber forest products. Tropical deforestation also forces climate change by contributing to ten percent of all global greenhouse gas emissions.

Projected increases in frequency and intensity of drought conditions will increase the incidence of wildland fires. Drought and fire cause economic strain, displacement, and food insecurity while also impacting biodiversity and the provision of ecosystem services such as water availability, water quality, and pollination. In addition, fire disasters cause health problems from poor air quality and the spread of disease.

RESPONSE

Firecast is a tool designed to help prevent the destructive effects of fires on natural ecosystems and human well-being. Firecast uses emerging technologies and cutting-edge research to empower local stakeholders with timely monitoring and forecasting information. The system packages and delivers short-term, fire-risk forecasting and near real-time (NRT) detection of fires, droughts, and deforestation to subscribers through a suite of delivery mechanisms customized to the needs of in-country decision makers, including email alerts and a website with interactive maps and reports. Users can tailor their alert subscriptions to specific areas of interest and their language of choice.

This novel early warning system supports national and international policy initiatives addressing climate change adaptation and REDD+ (Reduced Emissions from Deforestation and forest Degradation), whose purpose is to promote economic and environmental benefits from forest conservation. The system aims to support in-country needs with expanded monitoring capabilities that strengthen the following activities:

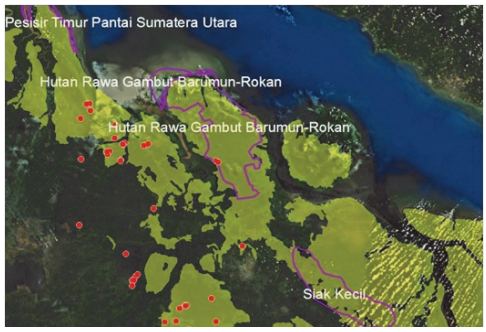
- REDD+ project development and implementation
- climate adaptation planning
- fire-related disaster prevention
- protected areas management
- policing of illegal activities
- sustainable land use planning
- enforcement of land use policies
- monitoring effectiveness of investments

CI's automated forest monitoring system, Firecast, disseminates daily email alerts of fire activity and fire risk forecasts based on observations from NASA satellites. The Firecast website includes monthly reports and maps documenting historic forest fire activity. (right)

Utilizing emerging technologies and cutting-edge research to empower local stakeholders with timely monitoring and forecasting information

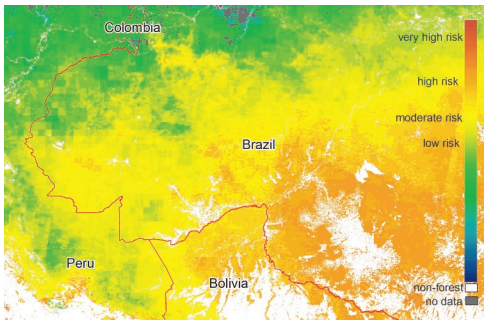
PRODUCTS

Active Fire Detection
Firecast detects deforestation in-action, delivering hourly MODerate resolution Imaging Spectroradiometer (MODIS) and Visible Infrared Imaging Radiometer Suite (VIIRS) active fire alerts to subscribers who use the data for active fire control, policing of illegal forest activities, enforcement of land use policies, REDD+ monitoring, and community-based conservation.



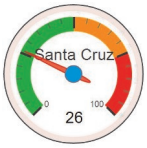
Fires in Indonesia, August 6, 2013 (shown in red). Firecast allows users to select highly customized criteria for alerts that include Key Biodiversity Areas (outlined in purple) and peat lands (in yellow-green). Firecast also incorporates local datasets customized to users' needs. (above)

Fire Risk Forecasting
Firecast uses satellite-based estimates of weather conditions to generate a daily indicator of forest flammability risk for the Amazon region and Indonesia through our partnership with Global Forest Watch. The Bolivian conservation organization, Fundación Amigos de la Naturaleza, uses Firecast's daily forest flammability risk product as an input to their national fire risk monitoring system. Daily fire risk forecasts are used for education and awareness to support fire prevention and sustainable land use practices.



CI's daily risk of forest flammability for the Amazon region warns of elevated risk of fire due to drought conditions (shown in orange and red in this map). (above)

Fire Season Severity Forecasting
These forecasts monitor sea surface temperatures in the North Atlantic and Pacific and forecast the intensity of fire activity in the Amazon several months before the fire season. Knowing the potential fire season severity in advance is extremely useful for fire management and prevention and sustainable land use planning.



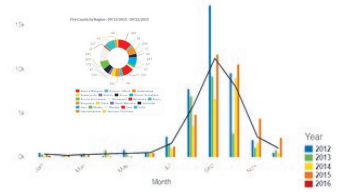
Fire season severity for the 2015 dry season for Santa Cruz, Bolivia.. These forecasts are generated by NASA Goddard and UC-Irvine. (left)

Fundación Amigos de la Naturaleza engages with local farming communities in Santa Cruz, Bolivia to raise awareness of land use practices aimed at reducing the risk of fire spreading to nearby natural ecosystems during high fire risk conditions. (above)

Forest Disturbance Alerts
High resolution (250-m) Quarterly Indicator of Cover Change (QUICC) maps based on changes in MODIS Vegetation Index images is provided for Madagascar and Peru.

INNOVATIVE TECHNOLOGIES

Dashboards
Enabled by our technology partner, Logi Analytics, users can create custom visualizations to gain deeper insights into the spatial and temporal distribution of fire incidences and trends. The dashboard allows for quick and easy analysis of 15 years of MODIS fire detections.

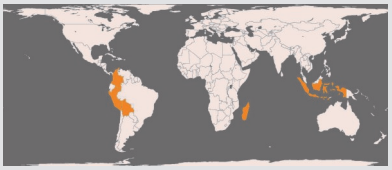


Firecast dashboard with interactive fire trends visualizations. (above)

Firecast OnSight
Firecast's mobile application allows users to view fire detections, forest disturbances, and log photos and observations to facilitate protected area management and help improve the accuracy of the active fire data.

Firecast OnSight mobile application. (left)

firecast.conservation.org



Firecast currently operates in Bolivia, Colombia, Peru, Madagascar, and Indonesia.

CONSERVATION INTERNATIONAL

OUR **VISION**
We imagine a healthy, prosperous world in which societies are forever committed to caring for and valuing nature, for the long-term benefit of people and all life on Earth.

OUR **MISSION**
Building upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the well-being of humanity.

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